

ply stated that, even if he had at his disposal a budget suitable for the work required in the shallow water of the river, the Government would not have the means of the operation would have first to be voted by Parliament. But he had good reasons for believing that the Government would not do so. The river was much too large and of too great a draught for that part of the river where dredging is required. After some general remarks on the subject, Mr. Parnell said that he would direct to the railway and the river traffic, wherein it was the duty of the Government to keep the river open. It was as much the duty of the Government to keep the river open as it was to keep the railway open. In answer to a question, the Minister finally pointed out that the Government would not be asked to do more than to place the usual amount of money at the disposal of the Tramways and the Corporation of Dublin and its neighbourhood. He would not be asked to place on them the Estimate of a sum of money for the purpose of carrying out the works which would be performed by the Corporation. Such a petition effectively expressed the feeling of the community in the neighbourhood of the river, and the Government would be moved by the movement his assistance. The deputation received of and accepted this last suggestion of Mr. Parnell, and Mr. Chamberlain, Mr. Parnell, and Mr. Parnell, he had given them, withdrew. In connection with the above it may be stated that it is contemplated by the Government that they have taken into consideration the petition which was presented to Mr. Parnell, and that the petition should be put by Mr. Parnell shall be put in the course of circulation. The majority of the deputation, but not the majority that the Government

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about that the claims urged in support of the matter legitimate and important. The river has been for so many years a great artery of commerce, and traffic, and has become so convenient and cheap a mode of communication to the metropolis, that much serious annoyance is caused being suffered up. To illustrate the age of the passage, it alone it may be mentioned that as far back as May 1818, passenger boats were prohibited from plying on Sabbath day. The passenger craft of these days is widely different from the present, and commodious river packets that ply on Patuxent and Sydney. In those "olden times" colony passengers were usually conveyed up the river in small boats, or in rafts, and in the latter shape of a boat propelled by horse-power, —a not very useful invention by the way,—which, in its turn, disappeared, and in its place came the steamboat PATERN.—The dry weather, which caused so much trouble, has come to an end at last, and for the past years we and our neighbours have enjoyed a succession of seasons of mild weather and moderate winds and squalls. Our farmers, who had almost forgotten how to plow, are practicing that art again; and the shopkeepers, who have never known the meaning of long drought since John, Jolla in the chorus of rejoicing;

we received two days' later news from Melbourne, gave us files down to the 15th. We make the following extracts from the *Australasian*:

"The Legislative Assembly, on Friday, a select committee, on the motion of Mr. Frides, seconded by Mr. Mulhock, appeared to draw up congratulatory resolutions, whereby the Government of the City of Edinburgh, on the occasion of the restoration of H. to health.

"The recent outbreak has completely diverted most of our strength and labour in the Botanic Gardens of their usual avocations, the application of the pruning-knife and hedge-cutting, tending to increase the bleak appearance of the place.

"The Williamson Volunteers have taken steps towards the children of the late gunner Dooley. It was decided, after meeting, that the Government should be asked that the Volunteer regulations did not permit any money to be granted from the funds of the corps for any other purpose than prizes, that a rifle match should be got up, and the prize money be devoted to the purchase of books for the Dooley's children. The match took place at the mainmast butts on Saturday afternoon, and is not doubt a success. It is generally held that the Government will be of the funds. On visiting the butts last Saturday, it is noted that precautionary measures had been introduced to prevent accidents from the future.

"There have more than once referred to a rumour that has been current for some time, that the Government would be asked to grant a sum of money to the Dooley's children, to be used for their education. It is not known whether this rumour is true or not, but it is a very interesting one, and it is a very interesting one, and it is a very interesting one."

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water-channel now being made to carry the water of the Collian to Sanduride, and expressed a hope that the fact would be made known by the officers of the Supply department and made public.

For negative information of a satisfactory kind has been obtained, but the rumour has continued to circulate, and has been repeated by persons definitely known to be true to no less than four feet, and to occur in a tunnel. It is understood that an attempt is being made to repair the injury by the bed of the Collian, and that it is in view of which it occurs, but this will be of no advantage as long as it should prove an efficacious remedy.

Concerning the importance of the subject and the magnitude of the injury to the country, it is not necessary to say, and believed in engineering circles, we think that the rumour should have the affair fully investigated, and if necessary, a recent professional visit made by detective to New South Wales, he succeeded in picking up a criminal walk. At Arundel he arrested a Chinese man named Ah Nam, who claimed to be a native of his countrymen at Muckfield dug the main boundary. The crime originated in a dispute between Ah Nam and Ah Sing, while the former summarily disposed of by striking a most choice blow at the latter on the head. In the locality of Sydney, Black received acquaintance with a professional swindler named Ah Nam, who had been in the country for some time.

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During the trial, last September 10, the jury was told that the defendant was an experienced fisherman. He has left sturdy tradesmen bemoaning incursions in the sums total of their respective cash-bags. From the front of the courtroom, the "fisher-lads," superscribed "Roderick Redtailious Steinsacker," both the men appeared before the City Bench yesterday. Plaintiff was represented for seven days, for the action of evidence; Ah Chang was remanded to Gaol.

Among the cases tried yesterday in the County Court were no. 10, William Wright, who showed up for litigation. The parties were farmers at Boroeholding adjoining parcels of land. During one of the days of the trial, Wright, who was the plaintiff, had been blown down, had toppled over on to his "gaff" a ground. Plaintiff asked defendant to remove it, defendant said he could "spare that tree," and refused to do so. Even though the defendant was the plaintiff, first as a trespasser by the defendant (through his on plaintiff's land; secondly, as for special damage, under the law of the defendant's tree, which was his huge *no. 10* *tree*), he was prevented from ploughing through of his ground which the tree covered. The judge gave the plaintiff a verdict on the trespass count, in the damage.

James Anna Bishop, accompanied by Mr. Schultz and Lancelotti, arrived on Saturday from Adelaide by the "Herald" and had been in the city for some time.

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NEW THINGS

his abandoned acceptance for a considerable time. The bank offered to advance the rate a month, payment to begin when the previous order was received. Plaintiff assented, an order was made and the bank offered to advance the rate. The true facts of the case may be conceived. To wait three years before payments commenced, and collect his debt during three years more, was more than the plaintiff was willing to do, and he started to an alteration of the arrangement. But he was told. The case could not be reopened. The civil servant or contractor, decidedly, was the plaintiff. It is not unlikely that when all the revolved accounts for two years have been finally adjusted the plaintiff will not have greatly the advantage of the bank.

The plaintiff occurred at the Ballarat Freehold Commission, on Wednesday evening, to a young man of the name of Williams, who was a clerk of the land office at Adelaide. From the Star we learn that he had engaged along with his mate at contract work in the drive, and the afternoon of the 14th of the drive, and the afternoon of the 14th of the drive, the deceased working in the face while his mate was driving timber. The latter, it appears, accidentally fell into the timber, and a false log was thrown down a large quantity of the timber to give way, bringing it a mass of earth, which is here of a sandy loose nature, and the deceased was killed.

however

many of the Episcopalian Churches yesterday, says the *Albany Herald* of the 15th, collections were made and the fund now being raised for the relief of the poor and orphans of the late Bishop of Grafton and Idaho, who, it will be remembered, was accidentally

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"Ball-goers, beware! petroleum

VESUVIUS.

(From the Cornhill for March.)

THE eruption on progress, as we write, from Mount Vesuvius, and the numerous and violent eruptions from this mountain during the two last centuries, seem to afford an answer to those who would see traces of a gradually diminishing activity in the earth's internal forces. That such a diminution is taking place we may admit, but that its rate of progress is perceptible—that we can point to a time within the historical epoch, may even within the limits of geological evidence, at which the earth's internal forces were certainly more active than they are at the present time, may, we think, be denied absolutely.

When the science of geology was but young, and its professors sought to compress within a few years (at the outside) a series of events which (we now know) must have occupied many centuries, there was room, indeed, for the supposition that modern volcanic eruptions, as compared with those of former times, are but the efforts of children compared with the work of giants. And, accordingly, we find a distinguished French geologist writing, even so late as 1829, that in ancient times "tous les phénomènes géologiques se passaient dans des dimensions centuplées de celles qu'ils présentent aujourd'hui." But now we have such certain evidence of the enormous length of the intervals within which volcanic regions assumed their present appearance; we have such satisfactory means of determining which of the events occurring within those intervals were or were not contemporaneous, that we are safe from the error of assuming that Nature at a single effort fashioned widely extended districts just as we now see them. And accordingly, we have the evidence of one of the most distinguished of living geologists, that there is no volcanic mass "of ancient date, distinctly referable to a single eruption, which can even rival in volume the matter poured out from Skaptar Jökull in 1783."

In the volcanic region of which Vesuvius or Somma is the principal vent, we have a remarkable instance of the deceptive nature of that state of rest into which some of the principal volcanoes frequently fall for many centuries together. For how many centuries before the Christian era Vesuvius had been at rest, is not known; but this is certain, that from the landing of the first Greek colony in Southern Italy, Vesuvius gave no signs of internal activity. It was recognised by Strabo as a volcanic mountain, but Pliny did not include it in the list of active volcanoes. In those days, the mountain presented a very different appearance from that which it now exhibits. In place of the two peaks now seen, there was a single, somewhat flat-topped summit, on which a slight depression marked the place of an ancient crater. The fertile slopes of the mountain were covered with well-cultivated fields, and the thriving cities Herculaneum, Pompeii, and Stabiae, stood near the base of the sleeping mountain. So little did any thought of danger suggest itself in those times, that the bands of slaves, murderers, and pirates, which flocked to the standard of Spartacus, found a refuge, to the number of many thousands, within the very crater itself.

But though Vesuvius was at rest, the region of which Vesuvius is the main vent was far from being so. The island of Pithecusæ (the modern Ischia) was shaken by frequent and terrible convulsions. It is even related that Prochyta (the modern Procida) was rent from Pithecusæ in the course of a tremendous upheaval, though Pliny derives the name Prochyta (or "poured forth") from the supposed fact of this island having been poured forth by an eruption from Ischia. Far more probably, Prochyta was formed independently by submarine eruptions, as the volcanic islands near Santorin have been produced in more recent times.

So fierce were the eruptions from Pithecusæ, that several Greek colonies which attempted to settle on this island were compelled to leave it. About 380 years before the Christian era, colonists under King Hiero of Syracuse, who had built a fortress on Pithecusæ, were driven away by an eruption. Nor were eruptions the sole cause of danger. Poisonous exhalations, such as are emitted by volcanic craters after eruption, appear to have exhaled, at times, from extensive tracts on Pithecusæ, and thus to have rendered the island uninhabitable.

Still nearer to Vesuvius lay the celebrated Lake Avernus. The name Avernus is said to be a corruption of the Greek word *Aornos*, signifying "without birds," the poisonous exhalations from the waters of the lake destroying all birds which attempted to fly over its surface. Doubt has been thrown on the destructive properties assigned by the ancients to the vapours ascending from Avernus. The lake is now a healthy and agreeable neighbourhood, frequently, says Humboldt, by many kinds of birds, which suffer no injury whatever even when they skim the very surface of the water. Yet there can be little doubt that Avernus hides the outlet of an extinct volcano; and long after this volcano had become inactive, the lake which concealed its site "may have deserved the appellation of 'atri jama Diis,' emitting, perhaps, gases as destructive of animal life as those suffocating vapours given out by Lake Quilotoa, in Quito, in 1797, by which whole herds of cattle were killed on its shores, or as those deleterious emanations which annihilated all the cattle in the island of Lancerote, one of the Canaries, in 1780."

While Ischia was in full activity, not only was Vesuvius quiescent, but even Etna seemed to be gradually expiring, so that Seneca ranks this volcano among the number of nearly extinguished craters. At a later epoch, Etna asserted that the mountain itself was sinking, so that seamen lost sight of the summit at a less distance across the sea than of old. Yet within the last 200 years there have been eruptions from Etna rivaling, if not surpassing, in intensity the convulsions recorded by ancient historians.

We shall not here attempt to show that Vesuvius and Etna belong to the same volcanic system, though there is reason not only for supposing this to be the case, but for the belief that all the subterranean forces whose effects have been shown from time to time over the district extending from the Canaries and Azores, across the whole of the Mediterranean, and into Syria itself, belong to but one great centre of internal action. But it is quite certain that Ischia and Vesuvius are outlets from a single source.

While Vesuvius was dormant, resigning for awhile its pretensions to be the principal vent of the great Neapolitan volcanic system, Ischia, we have seen, was rent by frequent convulsions. But the time was approaching when Vesuvius was to resume its natural functions, and with all the more energy that they had been for awhile suspended.

In the year 63 (after Christ) there occurred a violent convulsion of the earth around Vesuvius, during which much injury was done to neighbouring cities and many lives were lost. From this period shocks of earthquakes were felt from time to time for sixteen years. These were gradually more and more violent, until it

began to be evident that the volcanic fires were about to return to their main vent. The obstruction which had so long impeded the exit of the confined matter, and it was not, however, readily removed, and it was only in August of the year 79, after numerous and violent internal throes, that the superincumbent mass was at length hurled forth. Rocks and cinders, lava, sand, and scorice, were propelled from the crater and spread many miles on every side of Vesuvius.

We have an interesting account of the great eruption which followed, in a letter from the younger Pliny to the younger Tacitus. The latter had asked for an account of the death of the elder Pliny, who lost his life in his eagerness to obtain a near view of the dreadful phenomenon. "He was at that time," says his nephew, "with the fleet under his command at Misenum. On the 24th of August, about 1 in the afternoon, my mother directed him to observe a cloud of very extraordinary size and shape. He had just returned from taking the benefit of the sun, and, after bathing himself in cold water, and taking a slight repast, had retired to his study. He arose at once, and went out upon a height whence he might more distinctly view this strange phenomenon. It was not at this distance discernible from what mountain the cloud issued, but it was found afterwards that it came from Vesuvius. I cannot give a more exact description of its figure than that for it shot up to great height, the form of a trunk, which extended itself at the top into a sort of branches; occasioned, I suppose, either by a sudden gust of air which impelled it, whose force decreased as it advanced upwards, or else the cloud itself, being pressed back by its own weight, expanded in this manner. The cloud appeared sometimes bright, at others dark and spotted, as it was more or less impregnated with earth and cinders."

The extraordinary appearances attracted the curiosity of the elder Pliny. He ordered a small vessel to be prepared, and started to seek a nearer view of the burning mountain. His nephew declined to accompany him, being engaged with his studies. As Pliny left the house he received a note from a lady whose house, being at the foot of Vesuvius, was in imminent danger of destruction. He set out accordingly with the design of rendering her assistance, and also of assisting others, "for the villas stood extremely thick upon that lovely coast." He ordered the galleys to be put to sea, and steered directly to the point of danger, coasting in the midst of the turmoil around "as to be able to make and dictate observations upon the motions and figure of that dreadful scene." As he approached Vesuvius, cinders, pumice-stones, and black fragments of burning-rock, fell on and around the ships. "They were in danger, too, of running aground owing to the sudden retreat of the sea; vast fragments, also, rolled down from the mountain and obstructed all the shore." The pilot advising retreat, Pliny made the noble answer, "Fortune befriends the brave," and bade him press onwards to the point of danger, already prepared for embarkation and waiting only for a change in the wind. Exhorting Pompeianus to be of good courage, Pliny quietly ordered boats to be prepared; and "having bathed, sat down to supper with great cheerfulness, or at least (which is equally heroic) with all the appearance of it." Assuring his friend that the flames which appeared in several places were merely burning villages, Pliny presently retired to rest, and "being pretty fat," says his nephew, "and breathing hard, those who attended without actually heard him, for it became necessary to awaken him, for the boat which led to his room was now almost filled with stones and ashes. He got up and joined the rest of the company, who were consulting on the propriety of leaving the house, now shaken from side to side by frequent convulsions. They decided on seeking the fields for safety, and fastening pillows on their heads to protect them from falling stones, they advanced in the midst of the darkest night—though beyond the limits of the great cloud it was already broad day. When they reached the shore they found the waves running too high to suffer them safely to venture to put out to sea. Pliny, having drunk a draught or two of cold water, lay down on a cloth that was spread out for him; but at this moment the flames and sulphurous vapours dispersed the rest of the company and obliged him to rise. Assisted by two of his servants, he got upon his feet, but instantly fell down dead; suffocated, I suppose," says his nephew, "by some gross and noxious vapour, for he always had weak lungs and suffered from a difficulty of breathing." His body was not found until the third day after his death, when for the first time it was light enough to search for him. He was found as he had fallen; and looking more like a man asleep than dead.

But even at Misenum there was danger, though Vesuvius was distant no less than fourteen miles. The earth was shaken with repeated and violent shocks, "insomuch," says the younger Pliny, "that they threatened our complete destruction." When morning came, the light was faint and glimmering; the buildings around seemed tottering to their fall, and, standing on the open ground, the chariots which Pliny had ordered were so agitated backwards and forwards that it was impossible to keep them steady, even by supporting them with large stones. The sea was rolled back upon itself, and many marine animals were left dry upon the shore. On the other side of Vesuvius, a black and ominous cloud, bursting with sulphurous vapours, darted out long trains of fire resembling flashes of lightning, but much larger. Presently the great cloud spread over Misenum and the island of Capree. Ashes fell around the fugitives. On every side "nothing was to be heard but the shrieks of women and children, and the cries of men: some were calling for their children, others for their parents, others for their husbands, and only distinguishing each other by their voices; one was lamenting his own fate, another that of his family; some wished to die, that they might escape the dreadful fear of death; but a greater part imagined that the last and eternal night was come, which was to destroy the gods and the world together." At length a light appeared, which was not, however, the day, but the forerunner of an outbreak of flames. These presently disappeared, and again a thick darkness spread over the scene. Ashes fell heavily upon the fugitives, so that they were in danger of being crushed, and buried in the thick layer rapidly covering the whole country. Many hours passed before the dreadful darkness began slowly to be dispelled. When at length day returned, and the sun was seen faintly shining through the overhanging canopy of ashes, "every object seemed changed, being covered over with white ashes as with a deep snow."

It is most remarkable that Pliny makes no mention in his letter of the destruction of the

populous and important cities, Pompeii and Herculaneum. We have seen that at Stabiae a shower of ashes fell so heavily that, several days before the end of the eruption, the court leading to the elder Pliny's room was beginning to be filled up. And when the eruption ceased, Stabiae was completely overwhelmed. Far more sudden, however, was the destruction of Pompeii and Herculaneum.

It would seem that the two cities were first shaken violently by the throes of the disturbed mountain. The signs of such a catastrophe have been very commonly assigned to the earthquake which happened in 63, but it seems far more likely that most of them belong to the days immediately preceding the great outbreak in 79. "In Pompeii," says Sir Charles Lyell, "both public and private buildings bear testimony to the earthquake which happened in 63, but it seems far more likely that most of them belong to the days immediately preceding the great outbreak in 79. It is probable that the inhabitants were driven by these anticipatory throes to fly from the doomed towns." For though Dion Cassius relates that "two entire cities, Herculaneum and Pompeii, were buried under showers of ashes, while all the people were sitting in the theatre," yet "the examination of the two cities enables us to prove," says Sir Charles, "that none of the people were destroyed in the theatres, and, indeed, that there were very few of the inhabitants who did not escape from both cities. Yet," he adds, "some lives were lost, and there was ample foundation for the tale in all its most essential particulars."

We may note here, in passing, that the account of the eruption given by Dion Cassius, who wrote a century and a half after the catastrophe, is sufficient to prove how terrible an impression has been made upon the inhabitants of Campania, from whose descendants he is, in all probability, obtained the materials of his narrative. He writes that, "during the eruption, a multitude of men of superhuman stature, resembling giants, appeared, sometimes on the mountain, and sometimes in the environs; that voices and smoke were thrown out; the sun was hidden, and then the giants seemed to rise again while the sounds of trumpets were heard"—with much other matter of a similar sort.

In the great eruption of 79, Vesuvius poured forth lapilli, sand, cinders, and fragments of old lava, but no new lava flowed from the crater. Nor does it appear that any lava-stream was ejected during the six eruptions which took place during the following ten centuries.

In the year 1030, for the first time, Vesuvius was observed to pour forth a stream of molten lava. Thirteen years later, another eruption took place; then, ninety years passed without disturbance, and a long pause followed of 168 years. During this interval, however, the volcanic system, of which Vesuvius is the main but not the only vent, had been disturbed twice. For it is related that in 1198 the Solfatara Lake crater was in eruption; and in 1302, Ischia, dormant for at least 1400 years, showed signs of new activity. For more than a year earthquakes had convulsed this island from time to time, and at length the disturbed region was relieved by the outbreak of a lava stream from a new vent on the south-east of Ischia. The lava stream flowed right down to the sea, a distance of two miles. For two months, this dreadful outbreak continued to rage; many houses were destroyed; and although the inhabitants of Ischia were not completely expelled, as happened of old with the Greek colonists, yet a partial emigration of the inhabitants took place.

The next eruption of Vesuvius took place in 1806; and then, until 1831, there occurred only one eruption, and that an unimportant one, in 1800. "It was remarked," says Sir Charles Lyell, "that throughout this long interval of rest, Etna was in a state of unusual activity, so as to lead to the conjecture that the great Sicilian volcano may sometimes serve as a channel of discharge to elastic fluids and lava that would otherwise rise to the vents in Campania."

Nor was the abnormal activity of Etna the only sign that the quiescence of Vesuvius was not to be looked upon as any evidence of declining energy in the volcanic system. In 1538 a new mountain was suddenly thrown up in the Phlegrean Fields—a district included within its bounds Pozzuoli, Lake Avernus, and the Solfatara. The new mountain was thrown up near the shores of the Bay of Baia. It is 440 feet above the level of the bay, and its base is about a mile and a half in circumference. The depth of the crater is 421 feet, so that its bottom is only six yards above the level of the bay. The spot on which the mountain was thrown up was formerly occupied by the Lucrine Lake; but the outbreak filled up the greater part of the lake, leaving only a small and shallow pool.

The accounts which have reached us of the formation of this new mountain are not without interest. Falconi, who wrote in 1538, writes that several earthquakes took place during the two years preceding the outbreak, and above twenty shocks were felt in the night before the eruption. "The eruption began on September 29, 1538. It was on a Sunday, about 1 o'clock in the night, when flames of fire were seen between the hot-baths and Tripergola. In a short time the fire increased to such a degree that it burst open the earth in this place and threw up a quantity of ashes and pumice-stones mixed with water, which covered the whole country. The next morning the poor inhabitants of Pozzuoli quitted their habitations in terror, covered with the muddy and black shower, which continued the whole day in that country—flying from death, but with death painted in their countenances. Some with their children in their arms, some with sacks full of their goods; others leading an ass, loaded with their frightened family, towards Naples, &c. The sea had retired on the side of Baia, abandoning a considerable tract; and the shore appeared almost entirely dry, from the quantity of ashes and broken pumice-stones thrown up by the eruption."

Pietro Giacomo di Toledo gives us some account of the phenomena which preceded the eruption: "That plain which lies between Lake Avernus and the sea, and the sea, was covered a little, and many craters were made in it, from some of which water issued; at the same time the sea immediately adjoining the plain dried up about two hundred paces, so that the fish were left on the sand and prey to the inhabitants of Pozzuoli. At last, on the 29th of September, about two o'clock in the night, the earth opened near the lake, and discovered a horrid mud, from which were vomited furiously smoke, fire, stones, and mud composed of ashes, making at the time of the opening a noise like the loudest thunder. The stones which followed were by the flames converted to pumice, and some of these were larger than a man, and some as big as a cross-bow will carry, and then fell sometimes on the edge, and sometimes into the mouth itself. The mud was of the colour of ashes, and at first very liquid, then by degrees less so; and in such

quantities that in less than twelve hours, with the help of the above-mentioned stones, a mountain was raised of 1000 paces in height. Not only Pozzuoli and the neighbouring country were full of this mud, but the city of Naples also; so that many of its palaces were defaced by it. This eruption lasted two nights and two days without intermission, though not always with the same force; the third day the eruption ceased, and I went up with many people to the top of the new hill, and saw down into its mouth, which was a round cavity about a quarter of a mile in circumference, in the middle of which the stones which had fallen were boiling up just as a cauldron of water boils on the fire. The fourth day it began to throw up again, and the seventh day much more, but still with less violence than the first night. At this time many persons who were on the hill were knocked down by the stones and killed, or smothered with the smoke."

And now, for nearly a century, the whole district continued in repose. Nearly five centuries had passed since there had been any violent eruption of Vesuvius itself; and the crater seemed gradually assuming the condition of an extinct volcano. The interior of the crater is described by Brancini, who visited Vesuvius shortly before the eruption of 1831, in terms that would have fairly represented its condition before the eruption of 79:—"The crater was five miles in circumference, and about a thousand paces deep; its sides were covered with brushwood, and at the bottom there was a plain on which cattle grazed. In the woody parts, wild bears frequently haunted. In one part of the plain, covered with ashes, were three small pools, one filled with hot and bitter water, another salt than the sea, and a third hot, but tasteless." But in December, 1831, the mountain blew away the covering of rock and cinders which supported these woods and pastures. Seven streams of lava poured from the crater, causing a fearful destruction of life and property. Resina, built over the site of Herculaneum, was entirely consumed by a raging lava-stream. Heavy showers of rain, generated by the steam evolved during the eruption, caused, in their turn, an amount of destruction scarcely less important than that resulting from the lava-streams. Large masses of ashes and volcanic dust, these showers produced destructive streams of mud, consistent enough to merit the name of "aqueous lava" commonly assigned to it.

An interval of thirty-five years passed before the next eruption. But, since 1866, there has been a continual series of eruptions, so that the mountain has scarcely ever been at rest for more than ten years together. Occasionally there have been two eruptions within a few months; and it is well worthy of remark that, during the last century, when we have elapsed since the formation of Monte Nuovo, there has been no volcanic disturbance in any part of the Neapolitan volcanic district save in Vesuvius alone. Of old, as Brancini well remarks, there had been irregular disturbances in some part of the Bay of Naples once in every two hundred years; the eruption of Solfatara in the twelfth century, that of Ischia in the fourteenth, and that of Monte Nuovo in the sixteenth; but "the eighteen centuries have formed an exception to the rule."

It seems clear that the constant series of eruptions from Vesuvius during the past two hundred years has sufficed to relieve the volcanic district of which Vesuvius is the principal vent.

Of the eruptions which have disturbed Vesuvius during the last two centuries, those of 1779, 1798, and 1822, are in some respects the most remarkable. Sir William Hamilton has given a very interesting account of the eruption of 1779. Passing over those points in which this eruption resembled others, we may note its more remarkable features. Sir William Hamilton says, that in this eruption molten lava was thrown up in magnificent jets to the height of at least 10,000 feet. Masses of stones and scorice were to be seen propelled along by these lava jets. Vesuvius seemed to be surmounted by an enormous column of fire. Some of the jets were directed by the wind towards Ottajano; others fell on the cone of Vesuvius, on the outer circular mountain Somma, and on the valley between. Falling, still red-hot and liquid, they covered a district more than two miles and a half wide with a mass of fire. The whole space above this district, to the height of 10,000 feet, was filled also with the rising and falling lava columns, so that the air was continually present a body of fire covering the extensive space we have mentioned, and extending nearly two miles high. The heat of this enormous fire-column was directly perceptible at a distance of at least six miles on every side.

The eruption of 1793 presented a different aspect. Dr. Clarke tells us that millions of red-hot stones were propelled into the air to at least half the height of the cone itself; then turning, they fell all round in noble curves. They covered nearly half the cone of Vesuvius with fire. Huge masses of white smoke were vented forth by the disturbed mountain, and formed themselves at a height of many thousands of feet above the crater, into a huge, ever-moving canopy, through which, from time to time, were hurled pitch-black jets of volcanic dust, and dense vapours, mixed with cascades of red-hot rocks and scorice. The rain which fell from the cloud-canopy was scalding hot.

Dr. Clarke was able to compare the different appearances presented by the lava when it burst from the very mouth of the crater, and lower down, when it had approached the plain. As it rushed forth from its imprisonment in the crater, it was white, and brilliantly pure river, which burst for itself a smooth channel through a great arched chasm in the side of the mountain. It flowed with the clearness of "honey in regular channels, cut finer than art can imitate, and glowing with all the splendour of the sun. Sir William Hamilton had conceived," adds Dr. Clarke, "that stones thrown upon a current of lava would produce no impression. I was soon convinced of the contrary. Light bodies, indeed, of five, ten, and fifteen pounds' weight, made little or no impression, even at the source; but bodies of sixty, seventy, and eighty pounds were from time to time hurled on the surface of the lava, and kindled to a flame. A stone of three hundredweight, that had been thrown out by the crater, lay near the source of the current of lava. I raised it up on one end, and then let it fall in upon the liquid lava, when it gradually sank beneath the surface and disappeared. If I wished to describe the manner in which it acted upon the lava, I should say that it was like a loaf of bread thrown into a bowl of very thick honey, which gradually involves itself in the heavy liquid, and then slowly sinks to the bottom."

But, as the lava flowed down the mountain slopes, it lost its brilliant whiteness; a crust began to form upon the surface of the still molten lava, and this crust broke into innumerable fragments of porous matter, called scorice. Underneath this crust—across which Dr. Clarke and his companions were able to pass without other

injury than the singeing of their boots—the liquid lava still continued to force its way onward and downward past all obstacles. On its arrival at the bottom of the mountain, says Dr. Clarke, "the whole current," encumbered with huge masses of scorice, "resembled nothing so much as a heap of unconnected cinders from an iron-foundry," "rolling slowly along," he says in another place, "and falling with a rattling noise over one another."

After the eruption described by Dr. Clarke, the great crater gradually filled up. Lava boiled up from below, and small craters, which formed themselves over the bottom and sides of the great one, poured forth lava loaded with scorice. Thus, in place of a regular crateriform opening, a rough and uneven surface, secured by huge masses, whence vapour was continually being poured, so as to form clouds above the hideous heap of ruins. But the great eruption of 1822 not only flung forth all the mass which had accumulated within the crater, but wholly changed the appearance of the cone. An immense abyss was formed three-quarters of a mile across, and extending 2000 feet downwards into the very heart of Vesuvius. Had the lips of the crater remained unchanged, indeed, the depth of this great gulf would have been far greater. But so terrific was the force of the explosion, that the whole of the upper part of the cone was carried clean away, and the mountain reduced in height by nearly a full fifth of its original dimensions. From the time of its formation the chasm gradually filled up; so that, when Mr. Scrope saw it soon after the eruption, its depth was reduced by more than 1000 feet.

Of late, Vesuvius has been as busy as ever. In 1833 and 1834 there were eruptions; and it is but twelve years since a great outbreak took place. Then, for three weeks together, lava streamed down the mountain slopes. A river of molten lava swept away the village of Cercola, and ran nearly to the sea at Ponte Maddaloni. There were then formed ten small craters within the great one. But these have now vanished, and pressure from beneath has formed a vast cone where they had been. The cone has risen above the rim of the crater, and, as we write, torrents of lava are being poured forth. At first the lava formed a lake of fire, but the seething mass found an outlet, and poured in a wide stream towards Ottajano. Masses of red-hot stone and rock are hurled forth, and a canopy of white vapour hangs over Vesuvius, forming at night, when illuminated by the raging mass below, a glory of resplendent flame around the summit of the mountain.

It may seem strange that the neighbourhood of so dangerous a mountain should be inhabited by races free to choose more peaceful districts. Yet, though Herculaneum, Pompeii, and Stabiae lie buried beneath the lava and ashes, thrown forth by Vesuvius, Portici and Resina, Torre del Greco and Torre dell' Annunziata have taken their place; and a large population, cheerful and prosperous, flourish around the disturbed mountain, and over the district of which it is the somewhat untrustworthy safety-valve.

It has, indeed, been well pointed out by Sir Charles Lyell that, "the general tendency of subterranean movements, when their effects are considered for a sufficient lapse of ages, is eminently beneficial, and that they constitute an essential part of that mechanism by which the integrity of the habitable surface is preserved. Why the working of this same machinery should be attended with so much evil, is a mystery far beyond the reach of our philosophy, and must probably remain so until we are permitted to investigate, not our planet alone and its inhabitants, but other parts of the natural and material universe with which they may be connected. Could our survey embrace other worlds and the events, not of a few centuries only, but of periods as indefinite as those with which geology renders us familiar, some apparent contradictions might be reconciled, and some difficulties would doubtless be cleared up. But even then, as our capacities are finite, while the scheme of the universe may be infinite, both in time and space, it is presumptuous to suppose that all source of doubt and perplexity would ever be removed. On the contrary, they might, perhaps, go on increasing in number, although our confidence in the wisdom of the plan of nature should increase at the same time; for it has been justly said" (by Sir Humphrey Davy) "that the greater the circle of light, the greater the boundary of darkness by which it is surrounded."

THE DEFICIT.

(From the Pall Mall Gazette, April 24.)

THERE can be little doubt as to the mode in which, according to sound principles of finance, a deficit in the revenue ought to be supplied. If the deficiency be trifling, accidental, temporary, and complete—that is, its amount ascertained—and if trade be brisk and the ordinary sources of revenue prosperous and buoyant, so that a surplus may be confidently counted upon for the ensuing year, then the necessary funds may without risk or impropriety be provided for by an issue of Exchequer Bills, by a momentary augmentation, that is, of the floating or unfunded debt. If, on the other hand, the deficit be large, and if the expenditure which has caused it be in the nature of an investment rather than a casual or ordinary outlay—if it be devoted to some important public works either needed for the permanent security of the country or certain to be a source of future profit or saving—then the burden may fairly be divided between the present and succeeding generations, and the outlay wholly or in part, be provided for by a loan. Thus a loan is legitimate enough for such undertakings as fortifications, building of extensive or new arsenals and dockyards, and the like; and under due restrictions, also for prolonged wars undertaken in the permanent interests of the nation. It would of course be unjust and intolerable to lay upon the Englishman who chance to be living now the entire burden of an expenditure by which the Englishmen of all time are to benefit equally with those of the present generation. This mode of raising money should, however, always be regarded with some degree of suspicion, it is so easy and so tempting to the Chancellor of the Exchequer who is inclined to be lazy and who wishes to be popular. The recommendation of the loan system as a way of providing for exceptional expenditure is that it avoids frequent tampering with the regular items of taxation, changes in which are per se nearly always objectionable and inconvenient. The objection to it lies in the favour it is nearly sure to find both with taxpayers and with money lenders, and with the House of Commons as the representative of both. Whether loans, when indistinctly legitimate and warranted, should be contracted in terms, or in perpetual annuities, is a question on which the ablest financiers have not yet come to an agreement. Terrible annuities—borrowing on terms which secure the repayment of the principal and the extinction of the debt within a limited period—are, no

doubt, preferable in so far as they avoid a permanent augmentation of the National Debt. On the other hand, being by no means as favourable a security in the money market as Consols (or permanent annuities), they do not enable the Government to contract a loan on such economical conditions.

The general and sound rule, however, unquestionably is that the expenditure of the year should be provided for by taxation of the year, and that, unless under very peculiar circumstances, there should be no attempt to cast any portion of our burdens upon posterity. But then arises a further question, and in considering it we come across another temptation, and a very subtle one, to which Finance Ministers are exposed. A new tax is always ill received; it is resented by those who are called upon to pay it; it annoys individuals and classes (usually influential ones) if it be a direct tax; it affects and sometimes deranges trade if it be an indirect one; and in either case it involves a good deal of administrative cost and trouble. The augmentation of existing duties in the Excise or Customs, again, disturbs prices, and disgusts both customers and merchants. There is, however, one tax comparatively simple in its operation, admirably organised, easy to collect, and yielding nearly always precisely the calculated amount, and that is the income tax. The machinery for levying it is always in working order; it costs more to collect a shilling or eightpenny rate than a fourpenny rate; it is not felt by the numerical majority of the community; does not fall upon the special favourites of the present day, namely, the poor—at least not upon the ostensibly, clamorously, and notoriously poor. The temptation, therefore, is great to a Chancellor of the Exchequer who hates trouble and loves simplicity, especially if he loves mercy and public favour likewise, just to add a penny to the income tax for every shilling and a half he may require to produce an equilibrium, and to let the rest of the portion of his fiscal scheme. At the same time, however, we apprehend, be no question but that this insidious temptation ought to be resisted by him in the first instance—by the House of Commons as the protector of the public purse, and of equity between all classes of her Majesty's subjects, if he be found wanting in firmness or in fairness. Under the present revenue system, our taxation is fully enough divided between the direct and the indirect in the proportion of about one-third and two-thirds; and as the whole of the former and a very considerable part of the latter is paid by the "properly" classes, and as nearly the whole of the latter burdens fall upon them, there is every reason to believe (as we have shown in considerable detail on previous occasions) that the upper and middle ranks and the working or "wage" classes bear now each a pretty just proportion of the public burdens. All new burdens, therefore, ought to be distributed in a similar ratio among them, and the income-tax may properly be called upon to furnish half, but scarcely more than half, of whatever increase of taxation may be found necessary to defray the expenses of the Abyssinian war.

There is another reason, and one which may be urged at the present moment with peculiar propriety and cogency, why the cost of making good the present deficit should be shared equally between the direct and indirect taxation of the country. It is not at the time when we are increasing the political power of the masses of the people that we should exonerate them from their fair share of the political burdens. It is not when we are giving them new influences in voting taxes that they ought to wish to shrink from paying them. Only by indirect taxes, only by Excise or Customs duties laid upon the chief articles of general consumption, can the poorer classes of the community in Great Britain be made duly to contribute to the revenue without intolerable annoyance and expense; and all wise statesmen and just politicians will look with especial jealousy henceforth upon any symptoms of an inclination to alter the relative proportions of the two great divisions of our fiscal resources. The two most dangerous tendencies of democratic Governments—the two, therefore, to be most vigilantly guarded against, the more so as they assist and react upon each other—are extravagant expenditure and a limitation of the incidence and area of taxation by the substitution of direct for indirect fiscal burdens.

These being principles of finance which we hold to be indispensibly sound, we cannot, of course, regard Mr. Hunt's method of providing for the deficiency he announced last night with unqualified approbation. We do not enter into any of the details of his annual statement. In round numbers the Abyssinian expedition is expected to cost £5,000,000, of which £2,000,000 it is considered has already been expended and provided for, and £3,000,000 more will be needed and must be raised during the current year. These £3,000,000 the Chancellor of the Exchequer (though he calculates a surplus of nearly a million of ordinary revenue over ordinary expenditure for 1868-9) proposes to obtain by raising the income-tax from fourpence to sixpence in the pound. But, as by so means the whole sum can be collected within the year, he will anticipate the receipts by issuing £1,000,000 of Exchequer bills, to be repaid when the collection is complete. Mr. Hunt, while admitting that in strict justice one-half the sum ought perhaps to have been raised upon consumable articles, excused himself from adopting this plan by the very inadequate plea that the expenditure to be provided for was only temporary, and that a new tax was always a disturbing element to introduce, and scarcely desirable to impose for a single year. But, as Mr. Baring suggested, no new impost would have been necessary: an augmentation of five per cent. on the existing Customs' duties, or even on a few chief articles, such as tea, sugar, tobacco, malt, and spirits, would have yielded the sum required, and caused no derangement of trade, nor probably any decrease of consumption. The suggestion, however, was not received with any great favour by the House; and the result will be—and it is significant enough to those who desire to look a little beyond the present hour—that for probably the first time in our history the entire cost of a war will have been borne by a very limited class of our countrymen who pay income tax; and though that war be nothing but an Abyssinian expedition, and the expenses be only £5,000,000, the precedent is not without its meaning.

The first court-martial held in Abyssinia since the outbreak of the war, the Royal Commission just appointed to inquire into the raising system of administering justice in the army. Captain Macnaghten, of the 2nd Bombay Light Cavalry, has been tried at Sena for having on the 15th November last entered the tent of another officer of his corps, Lieutenant C. H. Halbert, who was under arrest, and for having then and there beaten him severely with a horsewhip. The court found Captain Macnaghten guilty, and sentenced him to receive a reprimand; a sentence which Sir Robert Napier refused to confirm, deeming it to be an insufficient punishment for the outrage committed. Sir Captain Macnaghten has been sent back to his duty, having accepted his punishment at all.

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